

ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation



Revised 10/5/2004

Page 1 of 7

CALIBRATION LABORATORIES

NVLAP LAB CODE 200679-0

IPS CORPORATION TOKYO CALIBRATION CENTER

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JAPAN

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ELECTROMAGNETICS - DC/LOW FREQUENCY

NVLAP Code: 20/E13

Magnetics

Range

Best Uncertainty $(\pm)^{note\ 1}$

Remarks

 $1.26 \ \mu T$ to $62.8 \ \mu T$ @ $50 \ Hz$

2.11 %

Magnetic Field Meter (IEC 61786) Response to H-field

September 30, 2005

Effective through

Man K. Will

ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation

RETURN STATES OF AMERICA

Revised 10/5/2004

Page 2 of 7

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NVLAP LAB CODE 200679-0

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TIME AND FREQUENCY

NVLAP Code: 20/F01 Frequency Dissemination

CISPR Receiver (CISPR 16-1-1)

| Range | Best Uncertainty $(\pm)^{note\ 1}$ | Remarks |
|---|------------------------------------|---|
| CISPR Band A, B, and C/D 9 kHz to 3.3 GHz | 1.35 % | Input Impedance |
| | 0.32 dB | Sine wave Voltage Accuracy - linearity |
| | 0.28 dB | Sine wave Voltage Accuracy - flatness (freq. response) |
| | 0.83 dB | Response to Pulse Amplitude Relationship Band A & B |
| | 0.94 dB | Response to Pulse Amplitude Relationship Band C & D |
| | 0.31 dB | Response to Pulse (variation with repetition frequency) |
| | 0.85 % | Overall Selectivity (Band A) |
| | 1.75 % | Overall Selectivity (Band B) |
| | 3.47 % | Overall Selectivity (Band C & D) |

September 30, 2005

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National Institute of Standards and Technology



National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation



Revised 10/5/2004

Page 3 of 7

CALIBRATION LABORATORIES

NVLAP LAB CODE 200679-0

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9.345 x 10⁻⁶

Frequency Measure (Intermediate Frequency)

0.19 dB

Random Noise

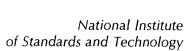
NVLAP Code: 20/F01 Frequency Dissemination

CISPR Pulse Generator (CISPR 16-1-1)

| Range | Best Uncertainty $(\pm)^{note\ 1}$ | Remarks |
|---|------------------------------------|---|
| CISPR Band A, B, and C/D 9 kHz to 3.3 GHz | 5.98 % | Pulse area and pulse Width |
| | 2.55 % | Pulse Repetition frequency |
| | 0.27 dB | Amplitude Variation |
| | 6.12 x 10 ⁻⁶ | Pulse frequency, 53131A stand alone |
| | 0.25 dB | Flatness of spectrum amplitude |
| | 0.16 dB | Sine wave amplitude |
| | 6.12 x 10 ⁻⁶ | Sine wave frequency, 53131A stand alone |

September 30, 2005

Effective through





ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation



Revised 10/5/2004

Page 4 of 7

CALIBRATION LABORATORIES

NVLAP LAB CODE 200679-0

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Signal Generator Frequency Measure

0.1 Hz to 225 MHz

 $5.27 \times 10^{-9} + 1 \text{ count}$

Frequency counter HP53131A with GPS receiver

10 Hz to 40 GHz

 $2.31 \times 10^{-9} + 1 \text{ count}$

Frequency counter Anritsu MF2414B with GPS receiver

ELECTROMAGNETICS - RF MICROWAVE

NVLAP Code: 20/R08

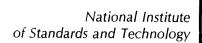
Microwave Antenna Parameters

| | Range | Best Uncertainty $(\pm)^{note\ 1}$ | Remarks |
|------------------------|----------------------------|------------------------------------|----------------------|
| Monopole A | antenna (IEEE 291 & ARP958 | 3) | |
| | 30 Hz to 50 MHz | 0.39 dB | Antenna Factor, Gain |
| LISN ^{note 2} | | | |
| | 0.1 MHz to 30 MHz | 0.5 dB | Impedance |
| | 0.1 MHz to 30 MHz | 0.5 dB | Insertion Loss |
| | 100 V to 230 V | 0.45 % | Voltage Drop |

September 30, 2005

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ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation

* CALLES OF RELEASE

Revised 10/5/2004

Page 5 of 7

CALIBRATION LABORATORIES

NVLAP LAB CODE 200679-0

IPS CORPORATION TOKYO CALIBRATION CENTER

| CDN ^{note 2} | | |
|--------------------------------|--------|----------------|
| 0.1 MHz to 10 MHz | 1.2 dB | Impedance |
| 10 MHz to 30 MHz | 0.7 dB | Impedance |
| 30 MHz to 100 MHz | 0.6 dB | Impedance |
| 100 MHz to 230 MHz | 0.8 dB | Impedance |
| 0.1 MHz to 10 MHz | 0.5 dB | Insertion Loss |
| 10 MHz to 230 MHz | 0.5 dB | Insertion Loss |
| RF Amplifier ^{note 2} | | |
| 0.01 MHz to 1000 MHz | 1.4 dB | Gain |

NVLAP Code: 20/R08

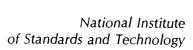
Microwave Antenna Parameters

| Range | Best Uncertainty $(\pm)^{note\ 1}$ | Remarks |
|---|------------------------------------|----------------|
| EM Clamp ^{note 2} | | |
| 0.1 MHz to 230 MHz | 0.5 dB | Insertion Loss |
| 150 ohm to 50 ohm Adaptor ^{note 2} | | |
| 0.1 MHz to 230 MHz | 0.5 dB | Insertion Loss |

September 30, 2005

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Mark to Mark





ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation

STATES OF AMERICA

Revised 10/5/2004

Page 6 of 7

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NVLAP LAB CODE 200679-0

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Current Probe / Current Injection Probenote 2

0.1 MHz to 230 MHz

0.5 dB

Insertion Loss

Isotropic Electric Field Probes (such as HI-4422)

0.1 MHz to 1000 MHz

1.6 dB

Correction Factor

Isotropic Electric Field Probes (such as HI-6005)

0.1 MHz to 1000 MHz

1.2 dB

Correction Factor

1000 MHz to 3500 MHz

2.2 dB

Correction Factor

50 ohm Termination note 2

0.1 MHz to 1000 MHz

0.4 dB

Impedance

September 30, 2005

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M- L. Mark

ISO/IEC 17025:1999 ISO 9002:1994

Scope of Accreditation

STATES OF AREA

Revised 10/5/2004

Page 7 of 7

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NVLAP Code: 20/R17

RF Microwave Power Meters

RF Absolute Power Measure (Sine Wave unmodulated)

Signal Generator

| Range | Best Uncertainty $(\pm)^{note\ 1}$ | Remarks |
|---------------------------------------|------------------------------------|--------------------------------|
| -40 dBm to +20 dBm (9kHz to 6 GHz) | 3.68 % | Power Sensor Agilent E9304A |
| -50 dBm to +20 dBm (10 MHz to 18 GHz) | 6.57 % | Power Sensor Agilent E4412A |
| -30 dBm to +20 dBm (50 MHz to 18 GHz) | 7.1 % | Power Sensor Agilent 8487A |
| -30 dBm to +20 dBm (18 GHz to 40 GHz) | 8.54 % | Power Sensor Agilent 8487A |
| -30 dBm to +20 dBm (40 GHz to 50 GHz) | 10.88 % | Power Sensor Agilent 8487A |

September 30, 2005

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^{1.} Represents an expanded uncertainty using a coverage factor, k=2, at an approximate level of confidence of 95%.

^{2.} Items available for on-site service.